

REMARKS

Claims 2-8, 12-16, and 19-24 are pending in this patent application. By this amendment, claim 21 has been canceled, claim 22 has been amended, and claims 25-27 have been added. Reconsideration of this patent application, as amended, is respectfully requested.

First 35 U.S.C. § 103 Rejection

Claims 2-6, 8, 12-15, and 19-23 were rejected under 35 U.S.C. § 102 as being anticipated by Kienzle, III et al. (U.S. Patent No. 6,478,802) in view of Gillies et al. (U.S. Patent No. 6,272,370). Applicants believe the Examiner made a slight error in the statement of this rejection, and thus will treat the rejection as being under 35 U.S.C. § 103. In particular, Applicants are assuming the Examiner's rejection is as follows: "claims 2-6, 8, 12-15, and 19-23 were rejected under 35 U.S.C. § 103 as being unpatentable over by Kienzle, III et al. (U.S. Patent No. 6,478,802) in view of Gillies et al. (U.S. Patent No. 6,272,370). Claim 21 has been canceled, and claim 22 has been amended. Applicants respectfully request reconsideration of claims 2-6, 8, 12-15, 19-20, and 22-23.

Discussion re: Patentability of Claim 5

Presumably, in an attempt to arrive at the invention of Applicants' claim 5, the Office Action states that "[i]t would have been obvious to one skilled in the art ... to place a plurality of marker rings around the shaft of the drill bit in the apparatus of Kienzle, III et al." (See Office Action at page 3, last four lines.) And

further the Office Action states this would have been obvious “in order to more accurately define the location and orientation of the shaft as it enters the body as taught by Gillies et al.” (See Office Action at page 3, last two lines.)

Gillies teaches placing radio-opaque and MR-visible markers 6 on a distal end of a *cerebral catheter*. (See, e.g., the cerebral catheter 1 shown in Fig. 1; and discussed at column 25, lines 39-43.) Gillies’ cerebral catheter 1 is a flexible drug delivery tube that is advanced to an affected site in a patient’s brain (e.g. a brain tumor) through which drugs are delivered to the affected site. The cerebral catheter 1 is made of a soft, biocompatible plastics material. (See, e.g., Gillies at column 25, lines 43-45.) Thus, Gillies teaches placing opaque markers on the distal end of a soft, flexible cerebral catheter.

It would not have been reasonably obvious to one skilled in the art to place a plurality of markers around the shaft of the drill bit in the apparatus of Kienzle based on the teachings in Gillies. Indeed, Applicants’ invention of claim 5 recites a drill bit which is driven to rotate about its axis by a drive unit, the shaft of the drill bit bearing a plurality of marker rings. Drill bits are, of course, configured to cut materials so as to create a cavity in an object, such as a proximal femur. (See, e.g., Kienzle at Fig. 4.) Many different technical issues exist with respect to the use of a soft, flexible cerebral catheter in comparison to the use a rigid drill bit. Indeed, the exposed surface of a drill bit is subjected to significant friction during a drilling operation. By placing a plurality of marker rings around the distal end of Kienzle’s drill bit, in a manner similar to Gillies’ placement of radiopaque markers 6 around the distal end of its soft, flexible

cerebral catheter 1, the marker rings on the distal end of Kienzle's drill bit would be subjected to a significant amount of friction during a drilling operation. This frictional contact would likely result in the wearing off of the marker rings from the shaft of the drill bit. No similar wearing issues exist with respect to use of Gillies' cerebral catheter. Significantly, the outer surface of a cerebral catheter would not be subjected to such high friction since the catheter would be gently advanced within the brain of a patient by a surgeon. In Applicants' invention of claim 5, the system extrapolates the location of the cutting surfaces (the distal part of the drill bit that is embedded in bone tissue) from the proximal portion of the drill bit (carrying the marker rings) that is *visible* to the at least two receiving devices (e.g. cameras). Thus, even though the plurality of marker rings is located on the drill bit, they remain visible to the receiving devices (e.g. cameras) outside the bone tissue, and thus not subject to potentially destructive high friction.

Accordingly, one skilled in the art would not reasonably find it obvious to place a plurality of markers around the shaft of the drill bit in the apparatus of Kienzle based on the teachings in Gillies. As a result, the proposed combination of Kienzle in view of Gillies does not establish a *prima facie* case of obviousness under 35 U.S.C. § 103 with regard to the invention of claim 5.

Further, it should be noted that the use of marker *rings* on the shaft of a drill bit has the advantage that the rings appear as lines as the drill bit shaft rotates about its axis. This facilitates the generation of location and orientation information in a way that is elegant and simple in comparison with the technique

which is disclosed in Kienzle, where the visible marker devices are fixed on the drive unit. Thus, claim 5 is further allowable over the cited art.

Discussion re: Patentability of Claims 2, 3, 4, and 6

Each of claims 2, 3, 4, and 6 depends directly or indirectly from claim 5. As a result, each of claims 2, 3, 4, and 6 is allowable for, at least, the reasons hereinbefore discussed with regard to claim 5.

Discussion re: Patentability of Claim 8

The discussion relating to the patentability of claim 5 is relevant to the patentability of claim 8. In particular, it would not have been reasonably obvious to one skilled in the art to place a plurality of markers around the shaft of the cutting tool in the apparatus of Kienzle based on the teachings in Gillies for at least the reasons hereinabove discussed with respect to claim 8. As a result, the proposed combination of Kienzle in view of Gillies does not establish a prima facie case of obviousness under 35 U.S.C. § 103 with regard to the invention of claim 8.

Discussion re: Patentability of Claims 13-15

Each of claims 13-15 depends directly or indirectly from claim 5. As a result, each of claims 13-15 is allowable for, at least, the reasons hereinbefore discussed with regard to claim 8.

Discussion re: Patentability of Claim 19

The discussion relating to the patentability of claim 5 is relevant to the patentability of claim 19. In particular, it would not have been reasonably obvious to one skilled in the art to place a plurality of markers around the shaft of the cutting tool in the apparatus of Kienzle based on the teachings in Gillies for at least the reasons hereinabove discussed with respect to claim 19. As a result, the proposed combination of Kienzle in view of Gillies does not establish a prima facie case of obviousness under 35 U.S.C. § 103 with regard to the invention of claim 19.

Discussion re: Patentability of Claims 20-23

Each of claims 20-23 depends directly or indirectly from claim 19. As a result, each of claims 20-23 is allowable for, at least, the reasons hereinbefore discussed with regard to claim 19.

Second 35 U.S.C. § 103 Rejection

Claims 7, 16, and 24 were rejected under 35 U.S.C. § 103 as being unpatentable over Kienzle, III et al. (U.S. Patent No. 6,478,802) in view of Gillies

et al. (U.S. Patent No. 6,272,370), and further in view of Ben-Haim (U.S. Patent No. 6,203,493). Reconsideration of claims 7, 16, and 24 is respectfully requested.

Claim 7 depends directly from claim 5. As a result, claim 7 is allowable for, at least, the reasons hereinbefore discussed with regard to claim 5. Claim 16 depends directly from claim 8. As a result, claim 16 is allowable for, at least, the reasons hereinbefore discussed with regard to claim 8. Claim 24 depends directly from claim 19. As a result, claim 24 is allowable for, at least, the reasons hereinbefore discussed with regard to claim 19.

Newly Added Claims 25-27

Claims 25-27 have been added. These claims recite novel and non-obvious limitations. In particular, the discussion relating to the patentability of claims 5, 8, and 19 is relevant to the patentability of new claims 25-27. Thus, new claims 25-27 is believed to be allowable. Moreover, each of claims 25-27 respectively depends directly from presumably allowable claims 5, 8, and 19. Thus, each of claims 25-27 is allowable over the cited art.

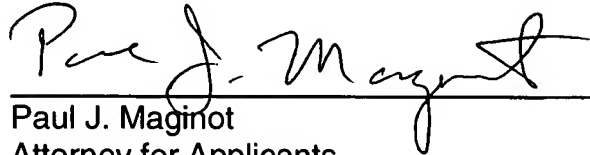
Conclusion

In view of the foregoing amendments and remarks, it is submitted that this application is in condition for allowance. Action to that end is hereby solicited. It is respectfully submitted that, if necessary to effect a timely response, this paper be considered as a Petition for an Extension of Time sufficient to effect a timely

response, and any deficiency in fees be charged, or any overpayment in fees be credited, to our Deposit Account No. 13-0014.

Respectfully submitted,

MAGINOT, MOORE & BECK LLP

A handwritten signature in dark ink, appearing to read "Paul J. Maginot", is written over a horizontal line.

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